

# FIRE MANAGEMENT PLAN

of

Fort Union Trading Post  
National Historic Site  
North Dakota / Montana



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**Department of the Interior  
National Park Service  
Midwest Region**

## Table of Contents

I.	Introduction.....	2
II.	Compliance with NPS Policy .....	2
III.	Goals and Objectives .....	3
	GMP and RMP Goals.....	3
	FMP Goals and Associated Objectives.....	4
IV.	Description of Site .....	5
	Physical characteristics of the Site .....	5
	Values to protect .....	6
	Fire History .....	7
	Wildland Fire Management Situation.....	8
V.	Scope of Wildland Fire Management Program .....	10
	Wildland fire management strategies to be applied.....	10
	Fire Management Units (FMUs).....	10
VI.	Wildland Fire Management.....	16
	Wildland Fire Suppression.....	16
	Records/Reports .....	20
VII.	Prescribed Fire Management.....	22
	Prescribed Fire Management Objectives .....	23
	Prescribed Fire Priority Areas.....	23
	Prescribed Fire Behavior .....	23
	Prescribed Fire Planning.....	23
	Fort Union Trading Post National Historic Site Prescribed Fire Units.....	24
	Prescribed Fire Monitoring.....	25
	Air Quality .....	25
VIII.	Fire Research.....	26
IX.	Monitoring .....	26
X.	Public Safety .....	26
XI.	Public Information and Education .....	27
XII.	PROTECTION OF SENSITIVE RESOURCES .....	27
	Archeological Sites .....	27
	Protection of Sensitive Natural Resources.....	27
	Modern Infrastructure and Developments .....	27
XIII.	Fire Critiques and Annual Plan Reviews.....	27
	Critiques .....	27
	Plan Reviews.....	28
XIV.	Appendices .....	29
	A. References.....	29
	B. Definitions.....	30
	C. NEPA and NHPA Compliance.....	32
	D. Wildland and Prescribed Fire Monitoring Plan .....	33
	E. Multi-Year Prescribed Fire and Fuels Reduction Schedule.....	34
	F. Training Analysis and Needs.....	35
	G. Maps .....	36
	H. Prescribed Fire Plan Outline.....	37
	I. Agreements .....	39
	J. Interagency Contacts.....	40

## **Introduction**

The Management Authorities (Directors Order-18, November 1998 and Reference Manual RM-18, February 1999) for the National Park Service, require that all parks with vegetation capable of supporting fire to develop a Fire Management Plan. The Natural Resources Component of the Resource Management Plan (RMP) for Fort Union Trading Post National Historic Site addressed the issue of Fire Management in a general manner. This specific action plan implements the selected management actions from the RMP. Its purpose is to outline in as detailed a manner as possible those actions that will be taken by Fort Union Trading Post National Historic Site in meeting the fire management goals for the area.

Servicewide fire management policy is expressed in the current revisions of the Directors Orders and attendant Reference Manual for the National Park Service, and "The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide", and is incorporated herein by reference. The site's fire management objectives conform to the referenced documents.

Authority for carrying out a fire management program at Fort Union Trading Post National Historic Site originates with the Organic Act of the National Park System, August 25, 1916. This act states that the primary goal of the National Park Service is to preserve and protect the natural and cultural resources found on lands under its management in such manner as will leave them unimpaired for future generations.

An environmental assessment serves as the NEPA documentation for this plan and is included as Appendix D. Montana and North Dakota State Historical Preservation Office compliance is documented in appendix D as well.

## **Compliance with NPS Policy**

Fort Union Trading Post National Historic Site was established in 1966 to "...commemorate the significant role played by Fort Union as a fur trading post on the upper Missouri River." As the preeminent post associated with the western American fur trade on the upper Missouri River, Fort Union Trading Post contributed significantly to the history of exploration, transportation, economics, and sociology of the American frontier in the early and mid-19<sup>th</sup> century. Active from 1829 until 1867, the fort was a primary staging depot for a fur trade based in St. Louis. Many noted European and American explorers, traders, artists, and travelers visited the fort. Fort Union Trading Post National Historic Site represents two important themes within the national park system: (1) The Original Inhabitants (Indian meets European subtheme) and (2) Western Expansion, 1763-1898 (Fur Trade subtheme).

A General Management Plan (GMP) for Fort Union Trading Post was approved in 1978. The GMP recognized that the identifiable site of the fort and the existing prairie lands are materially significant to the Trading Post's inclusion on the National Register of Historic Places. The GMP also included a description of the composition of vegetation

that existed within the historic scene. Objectives set forth in the GMP include direction that the NPS "...manage the overall area's historical and natural environment in a manner to promote recognition of the significant role that Fort Union trading Post played..." and "...restore and perpetuate the historic fort scene....". Values to be protected include the geologic resources, vegetation and wildlife, and the historic and prehistoric cultural resources found within the site's boundaries.

This plan is a detailed program of action to implement NPS Fire Management policies and objectives.

## **Goals and Objectives**

### ***GMP and RMP Goals***

Fire management goals are addressed generally in the Master Plan for the site, which states that the National Park Service will "...manage the overall area's historical and natural environment in a manner to promote recognition of the significant role that Fort Union trading Post played..." and "...restore and perpetuate the historic fort scene...".

The Resource Management Plan states that the basic resource management goal for Fort Union Trading Post National Historic Site is to "...campaign to restore the 120-acres of severely modified prairie surrounding the historic fort. As well as ...treats the floodplain and river banks in an on-going exotic plant abatement program, and ...clear and maintain open river vistas."

Fort Union Trading Post was established in 1828, but portrays the year of 1851. By 1851 the timber on the north side of the river had undoubtedly been cut and used either for building materials or firewood. The timber west of the fort has re-grown and appears as it might have prior to 1828. Some timber has returned east of the fort along the river terrace and in the river channel. On the south side of the river some of the land is in a natural state, some is partially natural and some has been cleared of timber.

Current management goals include:

*North side of the river:* Maintain the natural forest west of the fort. East of the fort the lower terrace and river channel will be mostly cleared of timber to replicate the historical scene. Willows east of the fort in the river channel will be kept at a short growth height so that they will serve to hold the soil but not impact the view.

The prairie above the terrace will be restored to a native vegetation ecosystem.

*South side of the River:* The goal is to restore and maintain the riverbank to a native forest ecosystem. The native vegetation will serve as a visual screen between the river and the farmland and development beyond the river corridor. The south side of the river the bank is seriously eroding, particularly where the land was cleared. Re-establishment of the native forest should help hold the soil and reduce erosion.

Fire once played a variety of natural roles in the ecosystem. Far from being a negative and destructive force, naturally occurring fires have helped to shape the landscape over time. In many cases, the natural landscapes we see today and find so beautiful is the legacy of past fires. Many plant and wildlife species have adapted over time to the presence of fire and, in some cases, depend on fire for their continued existence. To remove all fires from an ecosystem deprives that system of a powerful and dynamic natural force. The ultimate goal of fire management in the National Park System is to re-establish natural fire to park ecosystems where possible through wildland fire use and prescribed fires. Fires starting as a result of human activities will not be considered candidates for wildland fire use and will receive an appropriate management response.

The modern-day presence of human developments, as well as the presence of cultural and historic resources, dictates that the protection of life and property be a primary concern. Mechanical hazard fuel reduction, and in some cases a subsequent treatment with prescribed fire will be designed to facilitate protection of these resources.

Values to be protected include the geologic resources, vegetation and wildlife, and the historic and prehistoric cultural resources found within the site's boundaries.

### *FMP Goals and Associated Objectives*

Superimpose firefighter and public safety in every fire management activity.

1. No fire management operations will be initiated until all personnel involved receive a safety briefing describing known hazards and mitigating actions (LCES), current fire season conditions and current and predicted fire weather and behavior.
2. Qualified individuals that promote the safe and skillful application of fire management strategies and techniques will carry out fire management operations.
3. Site neighbors, site visitors and the local residents will be notified of all planned and unplanned fire management activities that have the potential to impact them.
4. Impose site closures at the discretion of the Superintendent.

Suppress all unwanted and undesirable wildland fires regardless of ignition source to protect the public, check fire spread onto private property and protect the natural, cultural and historic resources of the site.

1. Employ minimum impact tactics.
2. No off road vehicle use unless approved by the Superintendent.
3. No dozer or grader use unless approved by the Superintendent.

Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities:

Williams County, North Dakota, Rural Volunteer Fire Department  
Bainville, Montana, Volunteer Fire Department  
USFWS, North Dakota  
BLM Miles City District

## USDA, Forest Service, Little Missouri Grasslands

Use prescribed fire where and when appropriate as a tool to manage vegetation within the site boundaries, and where acceptable, across site boundaries to attain resource management objectives.

1. Increase plant diversity and reduce exotic species.
2. Employ hazard fuel reduction burns around suppression zones to reduce fire intensity and severity to lesser levels.
3. Restore fire as an ecological process.
4. Monitor the effects of fire on the ecosystem.

Modify fuel complexes around developed areas, along interface boundary areas and in conjunction with cultural and historic sites to reduce fire behavior to a more manageable level in order to protect critical sites.

1. Apply mechanical hazard fuel reduction around suppression zones to reduce fire intensity and severity to lesser levels.
2. Apply mechanical hazard fuel reduction around vulnerable cultural and historic sites for protection from fire damage.

## Description of Site

### *Physical characteristics of the Site*

The site currently comprises 434 acres on the eastern edge of Montana and western North Dakota, straddling the Missouri River just above the confluence of the Yellowstone and Missouri Rivers. The site is within four counties: Williams and McKenzie in North Dakota, and Roosevelt and Richland in Montana. Surrounding the fort is an expansive plain that today is a manageable mixed grass prairie, with flora and fauna of historic times and introduced species. The park goal is to restore native species of vegetation to the site. The Bodmer overlook and the current flood plain contain a remnant of the original native biome that has changed very little in its species diversity since the days of the old fort.

Semi-arid climate prevails in the Fort Union Trading Post National Historic Site area. Annual precipitation averages between 15 and 17 inches. Winters are comparatively dry with less than 1 inch of monthly precipitation occurring from November to February. Winds are relatively frequent and blow from any direction.

The area is divided into two distinctive vegetative zones by the terrace that separates the ancient flood plain on which the fort site is located from the active flood plain along the Missouri River.

The River Unit: Along the terrace edge and in the western portion of the active flood plain, thick growths of trees and shrubs are found; mostly cottonwood, green ash, and choke cherry. The remainder of the flood plain is covered by grasses and, in some places, thick stands of willow. In most years, this flood plain is covered by water (up to elevation 1,870 feet) during part of the year. In order to preserve the scenic view, no

development on the flood plain is contemplated, and public use in this zone is light. In addition, a strip of land, 200 feet in width, will be acquired along the south riverbank opposite the fort to serve as a vegetative, visual buffer zone.

An area north of the railroad, includes a scenic easement and the Bodmer Overlook and trail. The scenic easement is under agricultural use and is limited to small grains and pasture. The Bodmer Overlook will be maintained as native grassland and an overlook.

The Prairie Unit includes the land area around the fort, above 1900 ft. In this area, selective clearing of woody vegetation will be required to maintain a view of the river. Various non-native plant species have been introduced since the historical period of the park. A mixture of native and exotic grass species typical of the mid-grass prairie covers the prairie unit. This area had been farmed prior to establishment of the park with the last crop being alfalfa. Exotic grasses replaced the alfalfa over the great majority of the area. Grass species include primarily smooth brome and crested wheat grass. In 1996 the park began reseeding the former cropland with native grass species. The prairie unit will be restored, within practical limits, to the vegetation of the mid-1800's.

### *Values to protect*

The Fort Union structure now seen on this site is a "reconstruction" and although managed as a historical resource it is not considered historic for Section 106 purposes. However, significant historic and prehistoric artifacts may remain buried on the site. Historical and cultural artifacts are also stored on site within the structures and would be lost should the structure burn.

Private lands surround the park boundary. This area is predominantly used for farming and ranching with some mechanical hay operations occurring in the bottomlands. There are residential properties associated with the ranch and farm activity adjoining the park. The county road that transverse the property in an east-west direction provides two directions of access to the site. The entrance road to the visitor parking and the service road accessing the maintenance and residential area provide access to the fort for visitors and park staff. The Burlington Northern railroad parallels the north side of the county road.

Faunal species are characteristic of the northern plains.

Soils within the site have been mapped and include loam's, silty loam's, silty clay's and aquents (frequently flooded).

There is no permanent water in the site other than the Missouri River. Streams flow intermittently after storms or following heavy snowmelt.

The high quality of the airshed is occasionally affected by temperature inversions. Long, clear vistas combined with the extraordinary natural scenery enhance and accentuate the visitor's enjoyment of the natural resources of Fort Union Trading Post

National Historic Site and the surrounding region. Prevailing winds are from the southwest, which would result in smoke from fires being transported away from any population center. However, local diurnal winds would tend to transport smoke from a fire on the site into the river corridor in the evening and upslope, away from the valley during the day.

Under the Clean Air Act of 1977 (as amended), the site is designated a Federal Class II airshed. This affords the site modest protection of its air quality-related values.

### *Fire History*

Fire is a natural component of the mixed grass prairie and one of the forces under which the vegetation of Fort Union Trading Post National Historic Site evolved. Research indicates that prior to the turn of the century, fire burned grasslands in the area on an average of every 15 to 30 years depending upon the terrain and dryness (Wendtland & Dodd 1991). These low-intensity recurring fires thinned and prevented accumulation of heavy fuels, maintaining an area of predominate grassland (Weaver 1967, Biswell 1972, and Progulske 1974).

United States Fish and Wildlife Service researchers at Lostwood Refuge, 100 miles north east of Fort Union Trading Post suggest a fire frequency of less than 10 years there. Karen Smith reports that a frequency of greater than 10 years would allow for more woody vegetation than seems to occur naturally. Smith also recommends a “major defoliation event” of 4-6 years, based on her field observations at Lostwood Refuge.

After a major defoliation event, (grazing, haying or fire), grasses respond by utilizing its energy to send out rhizomes, rather than leafy growth. Without a defoliation event, there is a build-up of litter, which favors exotic (non native) grasses and woody vegetation by creating a shaded microclimate that is moister than natural conditions. Litter build-up prevents native grasses from having their growing point exposed to the sun, which they require to flourish.

Fire stimulates the slow nutrient cycle, releasing nutrients in a matter of days, which normally take 4-5 years to be released. Without a defoliation event, grasses become decadent and wildlife and insect numbers decline.

One hundred years of wildland fire suppression in the region has resulted in decrease secondary stages of plant succession important to wildlife species, and permitted woody vegetation to invade the prairie (Gartner and Thompson 1973). The historic pre-European settlement pattern of frequent low-intensity ground fire, which removed ground fuels, has increased the possibility of high intensity wildfires threatening life, property and resources.

A glossary of technical terms used throughout this document is attached as Appendix B.



## Wildland Fire Management Situation

### Prescribed Fire in FOUS

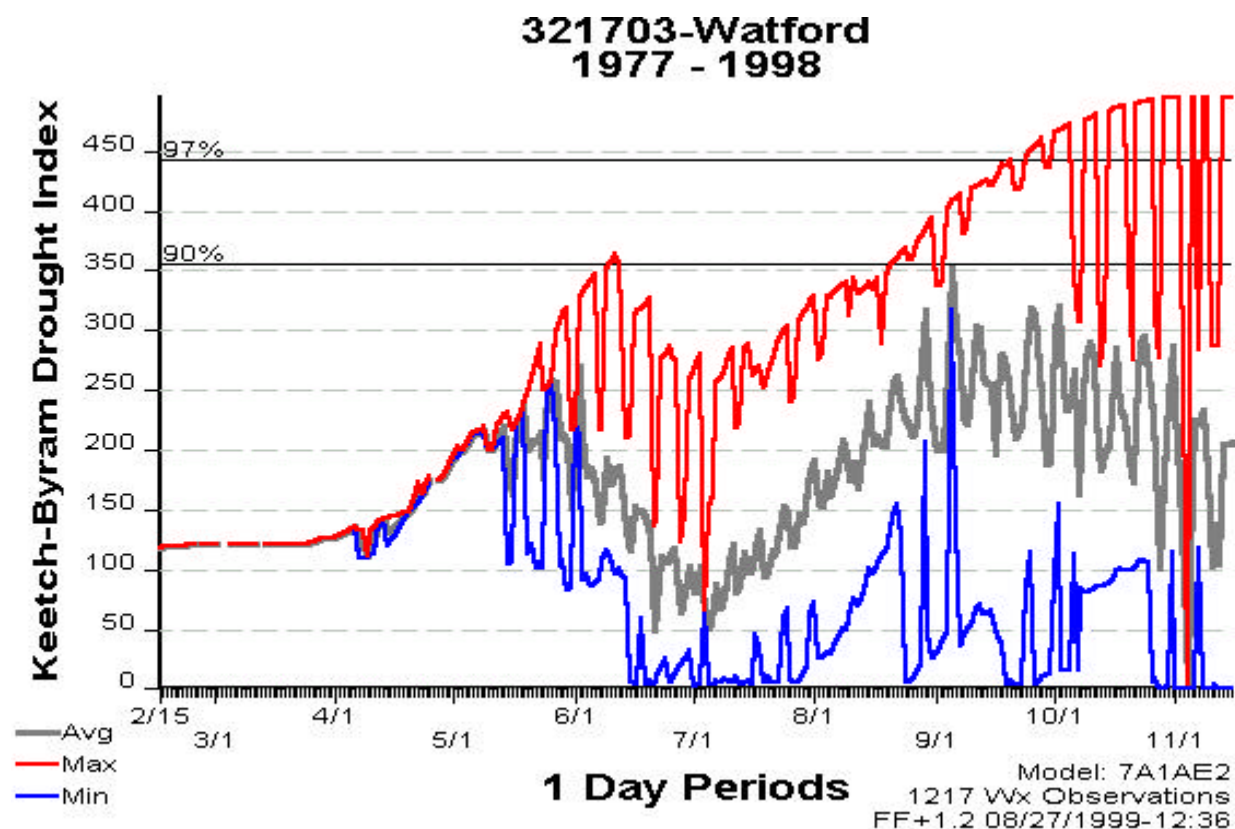
Prescribed fire in FOUS has not occurred in the past. Maintenance of roadside ditches through vegetation burning has occurred. The objective of burning the ditch vegetation is to remove vegetation that over time causes plugging of culverts and ultimate failure of the drainage system.

### Historical Weather Analysis

The US Forest Service and Bureau of Land Management have maintaining weather records since 1965 at their Watford City site (NOAA station number 321701). A manual station located behind the Watford City ranger station was update three years ago to a Remote Automated Weather System (NOAA station number 321703) and moved a short distance to be more representative of the vegetation in northwestern North Dakota. This will now provide a better representation of the fire season of the area and be operational year round.

### Drought Indices

The Keetch-Byram Drought Index (KBDI) is the drought index for FOUS. Keetch-Byram is a mathematically calculated drought indicator relating to the amount of moisture in the top seven inches of soil or duff/soil. It is based on the ambient air temperature and recent precipitation in relation to the mean annual rainfall for the specific RAWS station. The range of KBDI is 0-800 with 0 being saturated and 800 being maximum drought. The collected data from station number 321703 and archived data from Watford weather station number 321701 will provide future and past databases respectively for calculating drought indexes.



## **Fire Season**

The general fire season for eastern Montana and western North Dakota begins in late March and continues through early November with a quiet period from June 15<sup>th</sup> through August 15<sup>th</sup>. The March through June period coincides with the spring before everything greens up and the August through November coincides with the period when the grasses cure and temperatures are high. The June through November period corresponds to the greatest amount of recreational activity in the area. The last major wildfire occurred in June of 1988 and was started by a train.

## **Fuel Characteristics and Fire Behavior**

Fire behavior is basically a function of fuel type, fuel load, fuel moisture content, topography and local weather conditions. The vegetative types within Fort Union Trading Post National Historic Site represent a variety of fuel loading levels.

Fire behavior can then vary from fast moving grassland fires to slow to non-moving single tree fires. Shrub and tree communities, for the most part, are comprised of dense stands or heavy fuels with minimal fine fuels that would sustain fast moving fires, except during periods of extreme drought.

The dominant vegetation type found in the site is the mixed grass prairie, which covers the prairie. This vegetation type falls under NFDRS Fuel Model L and Fire Behavior Fuel Model 1. This fuel model becomes progressively more fire prone as the fire season progresses.

Below the terrace and in the active flood plan, thick growths of trees and shrubs are found; mostly cottonwood, green ash. Grasses cover the remainder of the flood plain and, in some places, thick stands of willow (Fuel Model E, Fire Behavior Fuel Model 9,). The fuel beds with a high percentage of grass are very fire prone early in the season prior to green-up and as the grasses cure out in late summer and fall.

## **Fuel Characteristics/Historic Observations**

Historical photos show a more diverse vegetative pattern. Fire suppression, agricultural practices and grazing in the past has reduced the native grasses and forbs.

## **Control Problems**

Most of the fuels present within the site are such that they present relatively easy control situations in normal to high fire danger periods. During periods of extreme fire danger all fuel complexes would present control problems.

An area of special concern exists within site boundaries due to heavy fuel loading and the presence of dead heavy fuels. This area encompasses the housing area and maintenance facility and the potential fire control problems warrant special attention especially during episodes of extreme fire danger.

## **Scope of Wildland Fire Management Program**

### *Wildland fire management strategies to be applied*

#### **Wildland Fire Suppression**

All wildland fires will be suppressed using the appropriate management response. The appropriate management response will vary from fire to fire and sometimes along the perimeter of a fire.

Appropriate management response options range from monitoring with minimal on-the-ground disturbance to intense suppression actions on all perimeters of the fire. The appropriate management response is developed from analysis of local situations.

Factors such as values to be protected, management objectives, external concerns and land use need to be formally assessed.

### *Fire Management Units (FMUs)*

There are two fire management units in FOUS, the Prairie FMU and the River FMU. Management objectives and fuels differentiate FOUS FMUs. A more detailed discussion of FOUS FMUs follows. Each FMU is further divided into smaller burning blocks that allow for manageable application of prescribed fire.

#### **Prairie Fire Management Units**

##### *Prairie FMU Description*

This FMU is the upper prairie area at elevations above 1900 ft. and the vegetation is primarily grass and shrub species. This area was mechanically leveled and farmed prior to the establishment of the fort as a protected historic site. Beginning in 1993 the park began an aggressive effort to re-establish native grass species, within smaller manageable units. This effort includes tilling the soil for three years to eliminate the exotic grass and weed species and then replanting with native grass species. Following planting of native species the areas may be hayed to reduce annual weed competition. Three to four years the native grasses are planted they become well established. Exotic grass and weed species continue to invade and become established within the native grass re-vegetation areas.

The Prairie Unit contains the reconstructed fort.

##### *Prairie FMU Management Objectives*

Within this FMU all wildland fires will be suppressed using the appropriate management response with the intent of minimizing loss of structures and property with the first priority being the safety of personnel and the public, which includes adjacent landowners.

1. Prescribed fire and mechanical treatment will be used to maintain a healthy prairie ecosystem and reduce hazard fuel build-ups that occur in the Prairie FMU facilitating protection of values at risk.
2. Interagency fire and emergency service agency participation will be encouraged within this FMU. Interaction with adjacent landowners through FOUS

participation in prevention programs and mutual hazard fuels reduction projects will be encouraged.

#### *Relationship of FMU Management to FMP Objectives*

Management of the Prairie FMU is designed to meet the following FMP objectives.

1. All fire management activities will have as the highest priority firefighter and public safety.
2. Prairie FMU appropriate suppression response will suppress all wildland fires regardless of ignition source to protect the public, check fire spread onto private property and protect the natural, cultural and historic resources of the site.
3. Emphasis will be placed on facilitating reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities.
4. One of the objectives of this FMU is to modify fuel complexes around developed areas, along the prairie boundary areas and in conjunction with cultural and historic sites to reduce fire behavior to a more manageable level in order to protect critical sites.

#### *Prairie FMU Tactical Management Objectives*

1. All fire management activities will consider safety of personnel and the public as the highest priority.
2. Site neighbors, park visitors and the local residents will be notified of all planned and unplanned fire management activities that have the potential to impact them.
3. All park closures are at the discretion of the Superintendent.
4. No fire management operations will be initiated until all personnel involved receive a safety briefing describing known hazards and mitigating actions (LCES), current fire season conditions and current and predicted fire weather and behavior.
5. Qualified individuals that promote the safe and skillful application of fire management strategies and techniques will carry out fire management operations.

#### *Mechanical Fuel Treatment*

1. Apply mechanical hazard fuel reduction around suppression zones to reduce fire intensity and severity to lesser levels. Can be used as the first step in a fuels reduction program followed by prescribed fire.
2. Apply mechanical hazard fuel reduction around vulnerable cultural and historic sites for protection from fire damage.

#### *Prescribed Fire*

Prescribed fires in the Prairie FMU will be accomplished during time periods and under a prescription that minimizes escape possibilities. If fuel loadings are high enough to make control of the burn difficult a two-stage process, such as mechanical treatment then prescribed burning will be considered.

#### *Prairie FMU Management Constraints*

1. Smoke management reporting procedures for burning in Montana and North Dakota will be followed for all prescribed fire operations.
2. Employ minimum impact tactics.

3. No off road vehicle use unless approved by the Superintendent.
4. No dozer or grader use unless approved by the Superintendent.
5. Protection mitigation measures for known historic and cultural resource sites in or near the project area must be assured before a prescribed burn project is initiated.
6. Chainsaw use must be approved by the Superintendent
7. Low level aircraft use and retardant must be approved by the Superintendent.

#### *Prairie FMU Physical Descriptors*

Topography on the northern side of the park is relatively level. Access to this FMU is by road and by walking.

This FMU is bordered by private land on the west, north and east and the Missouri River FMU on the south.

#### *Prairie FMU Fire History, Effects, and Behavior Characteristics*

This FMU does not allow for wildland fire use, therefore this section is not applicable.

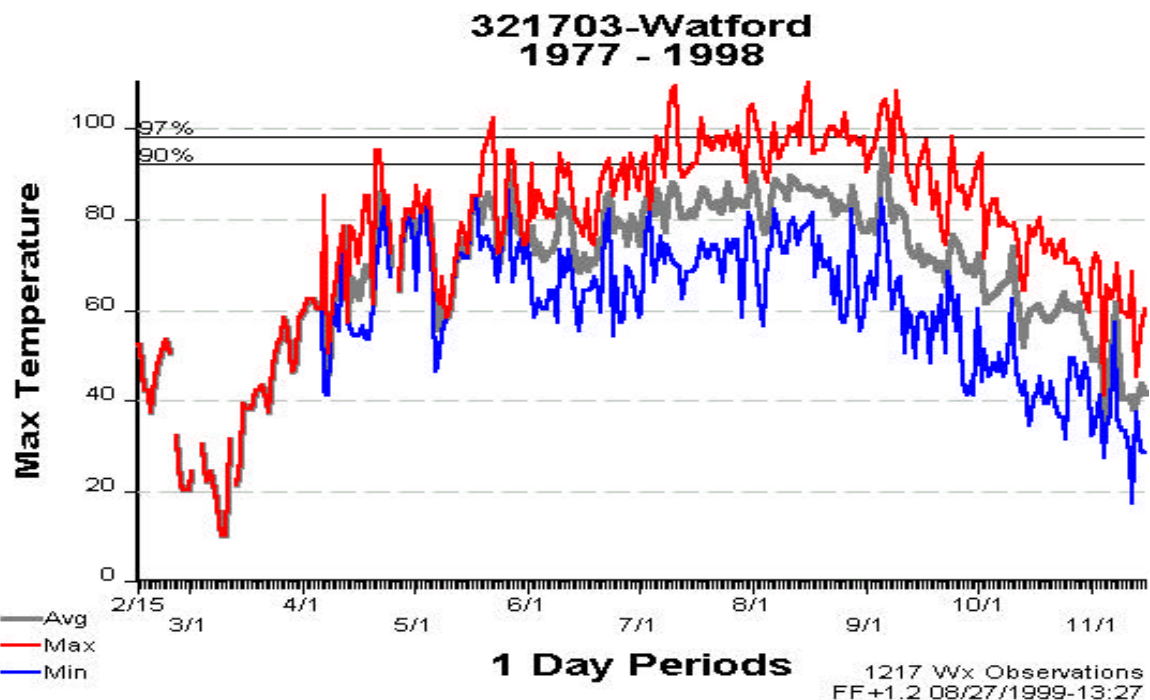
#### *Prairie FMU Values to be Protected and Special Concerns*

1. Developed areas within the Prairie FMU boundary are of highest concern.
2. Any known T&E species sites will be acknowledged and mitigated for during prescribed burn operations (none currently known).
3. A special concern for this FMU is the reduction of hazardous fuels build-up along the site boundary.

#### *Annual fire weather cycles*

The annual fire weather cycles are similar to that for the entire Site. Figure 2 shows the average and extreme temperatures for the site based on Weather Station 321703 data. Generally the fire season extends from May to mid-October.

Figure 2



## **River FMU**

### *River FMU Description*

The River FMU consists of all the remaining lands in FOUS that are not included in the Prairie FMU (below 1900 ft. elevation) and includes land both north and south of the river. This unit has a variety of topography, level in the active-river channel and slopes along the riverbank. Vegetation includes native and exotic species of grasses and trees. Management objectives are to re-establish and maintain a native wooded corridor along the river bottom on the south bank of the Missouri River to provide a visual barrier between the river and the farmland beyond. On the north side of the river, management objectives include to remove most trees in front of the fort and downstream to the eastern park boundary, to represent a historically accurate picture of the river in 1851. From the River Overlook, west the river will be maintained as a natural, pre settlement river corridor.

### *River FMU Management Objectives*

1. The main objective for the River FMU is to enhance natural processes and promote native flora and fauna diversity through fire use.
2. Personnel and public safety are the highest priority for all fire management activities.
3. All wildland fires will be suppressed using the appropriate management response.

### *Relationship of FMU Management to FMP Objectives*

Management of the River FMU is designed to meet the following FMP objectives.

1. All fire management activities will have as the highest priority firefighter and public safety.
2. River FMU has as a suppression strategy.
3. Use prescribed fire where and when appropriate as a tool to manage vegetation within the site boundaries, and where acceptable, across site boundaries to attain resource management objectives.
4. Achieve resource objectives such as reduce dead organic fuels, reduce woody vegetation in Block 5 to maintain a historically accurate river corridor.
5. Increase native plant diversity and reduce exotic species.
6. Employ hazard fuel reduction burns around suppression zones to reduce fire intensity and severity to lesser levels.
7. Restore fire as an ecological process.
8. Monitor the effects of fire on the ecosystem.

### *River FMU Tactical Management Objectives*

1. All fire management activities will consider safety of personnel and the public as the highest priority.
2. Site neighbors, park visitors and the local residents will be notified of all planned and unplanned fire management activities that have the potential to impact them.
3. All park closures are at the discretion of the Superintendent.
4. No fire management operations will be initiated until all personnel involved receive a safety briefing describing known hazards and mitigating actions (LCES), current fire season conditions and current and predicted fire weather and behavior.

5. Qualified individuals that promote the safe and skillful application of fire management strategies and techniques will carry out fire management operations.

#### *Mechanical Fuel Treatment*

1. Apply mechanical treatment in prescribed burn project sites as a method to prepare the site for future prescribed burn sites.
2. Apply mechanical fuel reduction around vulnerable cultural and historic sites for protection from fire damage.

#### *Prescribed Fire*

Prescribed fires in the River FMU will be accomplished during periods of time or under a prescription that minimizes escape possibilities. If fuel loadings are high enough to make control of the burn difficult or ground fuel loadings are too low for proper fire spread then a two-stage process, such as mechanical treatment prior to prescribed burning will be considered.

#### *River FMU Management Constraints*

1. Smoke management reporting procedures for burning in Montana and North Dakota will be followed for all prescribed fire operations.
2. Fire management activities will employ minimum impact tactics.
3. No off road vehicle use unless approved by the Superintendent.
4. No dozer or grader use unless approved by the Superintendent.
5. Protection mitigation measures for known historic and cultural resource sites in or near the project area must be assured before a prescribed burn project is initiated.

#### *River FMU Physical Descriptors*

This FMU consists of the relatively level shore of the Missouri River and gentle to steep slopes of the banks. Access to this FMU is by road and trail. The northern boundary of this unit shares the southern boundary with the Prairie FMU, other boundaries are the Missouri River and private land.

#### *River FMU Fire History, Effects, and Behavior Characteristics*

No known fire activity has occurred in this area in recent history. Fire across this landscape will promote native grasses and reduce brush species. A change of vegetative cover over the landscape will change the erosion potential of high river flows and erosion from rain events.

During pre-settlement and occupation of the fort the major fire regime (mixed grass prairie) had a fire return interval of approximately 3-8 years. There are two major fuel models represented in the River FMU. The fire-spread characteristics under normal and extreme conditions for these fuel types are summarized in Table 1.

Table 1:

Extreme Conditions*			
Fuel Model	Rate of spread	Flame Lengths	Fire Characteristics
Fuel Model 9	40 ch/hr	6.5'	These fires would create hot fast moving fires that would be stand replacement in nature, especially in areas of heavy fuel loading and closed canopies. In areas of lighter fuel loadings the fire would tend to torch out individual and clumps of trees. Spread rates could increase markedly if the fire became a crown fire through the stand.
Fuel Model 1	126 ch/hr	5.6'	Fires in this fuel model would move extremely fast. They would have a short residence time as these fuels are consumed rapidly.
Normal Conditions			
Fuel Model	Rate of Spread	Flame Length	Characteristics
Fuel Model 9	10 ch/hr	3.5'	These fires would tend to torch out periodically, but most of the time they would be ground fires. Torching would occur on sites with heavy fuels near a tree or clump of trees.
Fuel Model 1	101 ch/hr	5.0'	These fires also exhibit fast rates of spread. They will burn out rather quickly.

\*Extreme is for 1 hr fuel moisture 3% and midflame wind speeds of 10 mph

\*\*Normal is for 1 hr fuel moisture 6% and midflame wind speeds of 4 mph

#### *NFDRS Fuel Model H and Fire Behavior Fuel Model 9.*

The dominant vegetation type found in the site is Cottonwood and Ash overstory and grass understory. This fuel model becomes progressively more fire prone as the fire season progresses and live fuel moistures diminish and dead and down fuel moisture decrease. As the stand canopy closes over time and dead and down components increase they become more susceptible to large scale stand replacement fire events.

Early season fire effects in this fuel type will be minimal. Higher fuel moistures will reduce the overall consumption of fuels on the site. Reduced fuel consumption means less residence time for fire to impact soils, resident seedbeds, plant roots and stems. As the sites dry out, increases in fuel availability occur, therefore the more fuels present the more intense and longer duration the fire will exhibit, leading to more direct effects on the resident flora and fauna.

#### *NFDRS Fuel Model A, Fire Behavior Fuel Model 1*

A variety of shrubs, grasses, and forbs exist in this unit. The fuel beds with a high percentage of grass are very prone to fire as the summer season progresses and the grasses cure.

Fire effects from burns in these fuel beds are minimal until the grasses have actually cured out. Early season fires tend to burn off any buildup of thatch from preceding years. Fires tend to have very little residence time and therefore do not impact soils due to excessive heat.



#### *River FMU Values to be Protected and Special Concerns*

Private lands that border these units are of a concern.

1. Any known T&E species sites will be acknowledged and mitigated for during prescribed burn operations as well as fire suppression actions.
2. All known archeological and cultural sites will be mitigated for in all fire management activities.

#### *Annual fire weather cycles*

The annual fire weather cycles are similar to that of the entire site. The average high temperature will be slightly lower and relative humidity higher due to the effect of the river. Figure 2 shows the average and extreme temperatures for the site based on Weather Station 321703 data. Generally the fire season extends from May to mid-October.

## **Wildland Fire Management**

### *Wildland Fire Suppression*

#### **Range of Potential Fire Behavior**

Fire behavior in the site can range from fast moving ground fires in light fuels to stand replacement fires in more dense stands of trees. For more detailed discussion refer to the fire behavior descriptions under the FMUs.

#### **Prevention/Wildland Fire Use Educational Activities**

Fire prevention includes all activities designed to reduce the number of human-caused wildfires that occur in the site. The objective of the program will be to minimize preventable fires.

Prevention activities for FOUS will consist of prevention signing, prevention messages through interpreters and staff and prevention patrols during periods of very high fire danger. Associated with prevention messages will be wildland fire use educational and project awareness messages tailored for the public.

Fire prevention and wildland fire use will be discussed at a selected staff safety meeting in the early spring to make sure all members are aware of concerns and procedures regarding response to wildfires and actions related to prescribed and wildland use fires.

During periods of high fire danger, the general public and park visitors will be informed of conditions through press releases, interpretive media and, if necessary, the posting of signs at site entrances and the visitor center.

#### **Annual Training**

Annual training will consist of annual fire fighter safety refresher training, first aid and other safety training for appropriate individuals. As a staffing need for FOUS an IC Type IV should be on site, this will be a training priority for FOUS.

## **Annual Preparedness Activities**

### *January*

Perform fire physical exams triennially (every three years) as per standards in RM-18, Fire Management Guidelines. Pack test, fire personnel annually, as per standards in RM-18 and update and submit fire qualifications to SACS computer.

### *March*

1. Inventory fire equipment, order needed supplies and update equipment list. Includes both fire cache and personal equipment.
2. Complete all prescribed fire plans for upcoming season and have signed off by Superintendent.
3. Prepare prescribed fire briefing messages for public notification.
4. Obtain or prepare signs for wilderness fire use and prescribed fire interpretation.

### *April*

1. Review Step-up Plan.
2. Inspect fire cache and ensure that equipment is ready.
3. Check the established Regional procedure for utilizing suppression and emergency preparedness accounts.

### *May*

Check operation of slip-on pump and backpack pumps.

### *May to Mid-October (fire season)*

Operate slip-on pump monthly

### *November*

1. Critique fire season including all fire management activities (i.e. wildland fire suppression, use fires and mechanical fuel treatment, prevention, etc.)
2. Evaluate individual performance of site staff to correct deficiencies and recommend personnel for training.
3. Review and revise Fire Management Plan, if necessary.

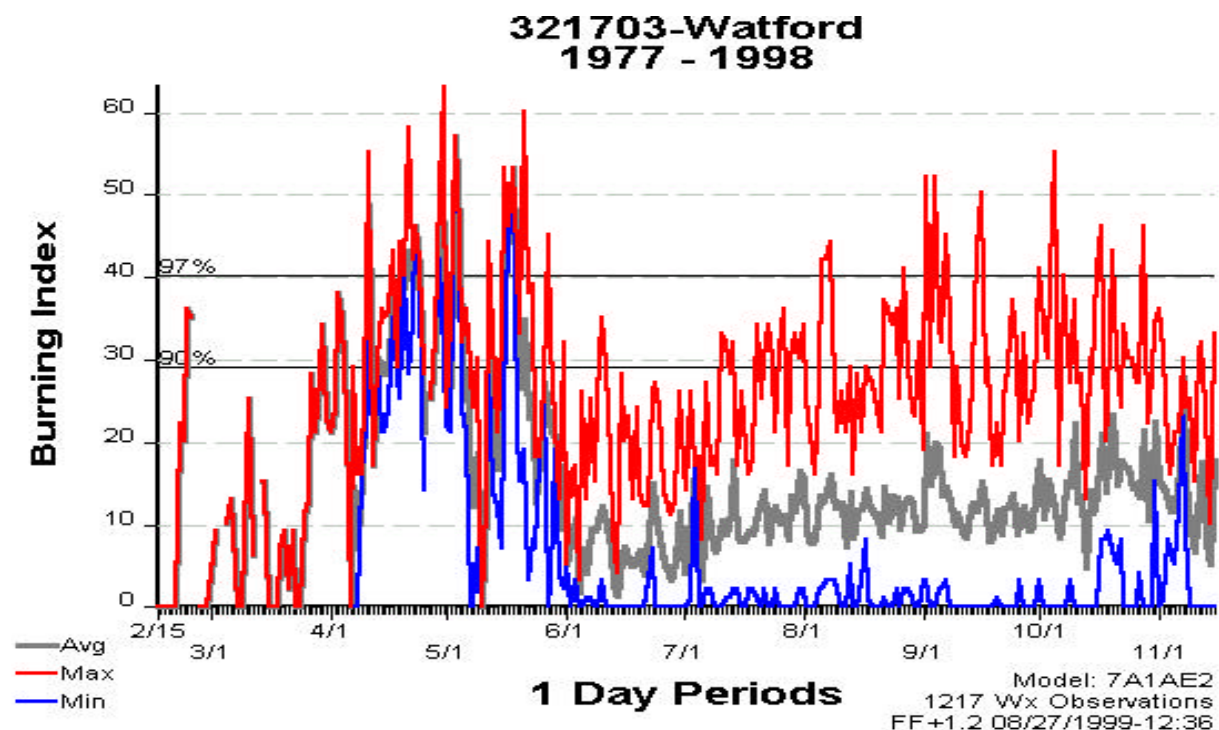
## **Step-up Plan**

The Superintendent or FMO has the ability to increase one, preparedness staffing class for unusual site events that would increase the potential of wildland fire.

Preparedness activities during the fire season are based on the National Fire Danger Rating System (NFDRS). Fire days are broadly divided into five staffing classes according to the intensity of danger factors as indicated by the Burning Index (BI).

The BI integrates the effects of weather, fuels, and topography to estimate potential fire behavior and the corresponding effort required to contain a fire. The staffing classes relate to the expected severity of fire conditions.

Preparedness actions are based on the predicted fire weather before 1400 hours and on actual fire weather after 1400 hours for all staffing classes.



The Burning Indices established below are based on ten years of data collection at the site's fire weather station from 1977-1998. Those data indicate a value for the 90th percentile equaling a BI of 29. The value for the 97th percentile is 40. The analysis was based on using Fuel Model A, a Slope Class of 1 (0-25 percent), perennial herbs, and a Climate Class of 1 (Semi-arid).

Table I - Burning Index and Staffing Class

<u>Burning Index</u>	<u>Staffing Class</u>
0-9	I
10-19	II
20-28	III
29-39	IV
40+	V

Fire conditions that typify each staffing class and the corresponding preparedness actions required are as follows:

### **Staffing Classes I and II (BI 0-19)**

#### *Conditions*

Fires will present a low to moderate level of control difficulty. Fires occurring at this level may be controlled with existing forces. Wind speed and direction will determine severity of fire spread. Fine fuels will be drying.

#### *Preparedness Actions*

1. Fire weather reviewed daily.
2. Hand tools and portable equipment in a state of readiness.
3. Initiate wildland fire use location and purpose messages for dissemination to the public.
4. If the LAL is between 4 and 6 for the next day automatically bump up to a staffing class 4

#### *Suppression Actions*

1. One qualified employee will depart within five minutes for the fire location.
2. Additional attack forces will be dispatched after size-up and upon request of the first firefighter to arrive.
3. If necessary, cooperator assistance will be requested as described under the dispatch section.
4. If the fire location is along the road, the site's slip-on pump will be dispatched.

### **Staffing Class III (BI 20-28)**

#### *Conditions*

Fires will present a moderate level of control difficulty. Light fuels are becoming dry. Heavy fuels are drying. Mop-up will be more difficult and time-consuming.

#### *Preparedness Actions*

1. All actions specified for Staffing Class I and II days will be conducted.
2. Ensure that a minimum of two qualified fire personnel are available for initial attack.
3. If the LAL is between 4 and 6 for the next day automatically bump up to a staffing class 5

#### *Suppression Actions*

All suppression actions indicated for Staffing Classes I and II will be taken.

### **Staffing Classes IV and V (BI 29+)**

#### *Conditions*

Fire will present a moderate to high level of control difficulty. Initial attack and reinforcing crews may have difficulty controlling a fire at this level. All fuels are dry. Air temperature is high and humidity is low. Strong gusty winds are possible. Spotting may occur.

#### *Preparedness Actions*

1. All actions specified for Staffing Class III days will be conducted.
2. Visitor Center personnel will alert the public to fire hazards.
3. Interpretive activities will include a fire safety message.
4. Emergency suppression funds (PWE 249) may be used to bring staff to required levels. However, regularly scheduled personnel will be used to the extent possible. It is recognized that both nonessential routine activities and project work may be postponed on Class IV and V days.
5. Fire danger notices will be posted.

### *Suppression Actions*

All actions specified for Staffing Class III days will be taken.

#### **Pre-attack Plan**

Due to the small size and scope of the fire program at Fort Union Trading Post National Historic Site, no formal pre-attack plan has been written. Certain preparations and procedures are however established prior to and during the fire season. Some are mentioned in the Annual Preparedness Activities section, other pre-attack plans are informally discussed among the fire crew during practice or equipment maintenance assemblies. The value of a written pre-attack plan, or checklist, is however recognized. Such preparation will inevitably emerge as the fire program evolves into a more complex and operationally committed program.

#### **Minimum Impact Suppression Tactics**

1. All fire management activities in FOUS will rely on tactics which do a minimum amount of resource damage while maintaining the safety of firefighters, personnel and the public as the highest priority.
2. Superintendent approval is needed for off road use of vehicles and bulldozers some mechanized equipment and low flying aircraft.

#### **Rehabilitation**

All suppression activities will be carried out in such a manner as to cause the least amount of resource damage. After the fire is declared out, all litter and trash will be removed. Dug firelines will be refilled and erosion control devices installed if necessary. Stumps will be flush cut. Logs and brush will be chopped and scattered or removed. The severity of the burn and its resultant impact will be considered in determining the need to seed or otherwise re-establish native plant species. Such efforts regarding landscaping and plants will be in full compliance with NPS Management Policies and given prior approval of the Regional Director. A rehabilitation plan, outlining what species are to be planted, techniques to be used, locations and cost estimates will be prepared before any action is taken.

### *Records/Reports*

#### **Wildland Fire Implementation Plan (WFIP)**

A wildfire implementation plan will be prepared for every wildland fire and will be the responsibility of the FMO or Collateral Duty FMO to have completed.

#### **Individual Fire Reports (DI-1202)**

The basic report for documenting a wildland fire is the Individual Fire Report (DI-1202). The report is valuable as it provides an historical record of the fire regime for the site. As such, it is important that all fires that occur within the boundaries be documented using, at a minimum, this form. This includes fires that go out on their own when the location can be documented. The DI-1202 is the basic document used by the Boise Interagency Fire Center to document a fire occurrence. Incidents known as Support Actions where site personnel respond to fires outside the site (including out of state) are reported on this form. It is impossible for an individual to receive credit for jobs performed on any fire unless NIFC has a record of that fire from the site in the form of a

DI-1202 and its attached Fire Number.

The Incident Commander for the fire is the person responsible for preparation of the Individual Fire Report. In most cases, this is the individual who put the fire out. That person may also want to complete a Case Incident Report (Form 10-343) for the fire but that would be in addition to the DI-1202. Fires will be sequentially assigned a fire number by calendar year, i.e. fires in 1989 are numbered 8901, 8902, etc.

**A complete fire report will include the following attachments, if applicable**

1. Any written policies, guidelines or authority statements signed by the Superintendent.
2. Copy of the WFIP
3. Copies of equipment purchased or personnel request orders.
4. All situation maps.
5. Personnel lists (including Emergency Time slips.)
6. Press clippings.
7. Accident reports.
8. All weather data reports and records.
9. Documentation of financial charges made against the assigned PMP.
10. Rehabilitation plan.

The report is then submitted, in draft, to the Superintendent. Instructions for filling out the report are found in RM-18; some local procedures are listed in Appendix B. That person will review the report for completeness. He/she will then enter the data into the site database for permanent record keeping. That procedure also prepares a final draft of the form for the files. The information will also be entered into the Shared Applications Computer System. Finally, a copy of the DI-1202 will be sent to the Regional Fire Management Officer for that person's records.

**Fire Experience and Qualifications**

The Shared Applications Computer System (SACS) at the National Interagency Fire Center (NIFC) is the central repository for all individual fire experience and training records. The Chief Ranger at Theodore Roosevelt National Park (THRO) is the person responsible for entering all training and experience into the computer and ensuring the information is up to date.

**Daily Situation Reports**

Daily Situation Reports are required on those days when the Burning Index reaches the 90th percentile and the site moves into Staging Class IV and V or when a fire has occurred or is on-going. The Chief Ranger at THRO is responsible for the preparation of the report and entering it into the Wildland Fire Management Computer System by 9:30 a.m.

**Smoke Management Reports**

Smoke Management reports will be made by the Unit Fire Manager as agreed to in the Memorandum of Understanding with the states of Montana and North Dakota and Federal Agencies.

## **Report of Fire**

When a report of a fire is received, the following information should be collected from the reporting party:

1. Name of reporting party
2. Address
3. Phone number
4. Location of fire and extent
5. If fire is reported in person, ask if the reporting party is willing to show the investigating ranger the location, otherwise, determine if the person can be re-contacted if there are additional questions.

## **Resource Order Form, NFES 1470**

All assistance requests must be documented on the Resource Order Form, NFES 1470. These forms can be transmitted verbally over the telephone. The order form is, in essence, an obligating procurement document.

Whenever an out-of-park incident management team is ordered, the Superintendent must provide a written limited delegation of authority and a briefing package to the incoming Incident Commander. See RM-18, Chapter 9, Exhibit 4, pages 1 - 4.

## **Year-end Accomplishment**

Completion of year-end accomplishment reports is the responsibility of the person with FOUS collateral FMO duties.

## **Prescribed Fire Management**

The use of prescribed fire to adequately manage and restore natural resource processes must be initiated at Fort Union Trading Post National Historic Site. Prescribed fire is a very important tool to manage vegetation communities and to achieve resource management objectives of the park. The Resource Management Plan for the park states a need "to restore and perpetuate the historic fort scene within practical limits to the period of the early 1850's in accordance with management policies for historic preservation." The management objectives section of the park's Statement for Management (1991) states "To manage the area's overall historical and natural environment in a manner that promotes the recognition of the significant role played by Fort Union Trading Post in the history of the Upper Missouri River region."

The vegetation communities at FOUS have been severely altered from extensive agricultural activity during the late 1800's and 1900's. Fire suppression has also had a dramatic effect on the vegetation communities. The combination of agriculture and fire suppression has led to a decrease in native grass and herbaceous cover. The park has excluded agricultural practices, which eliminates the source of impact and increases the potential for successful restoration of desirable grass dominated communities following a fire event. Prescribed fire is an appropriate management action to facilitate the desired vegetation type conversion.

The scope of the prescribed fire program must focus on restorable sites that have the potential to support the desired plant community. This plan is not suggesting wholesale

removal of brush and trees. The prescribed fire program should focus on reducing the density of post settlement non-native species that have invaded grass-dominated sites in the last 130 years.

### *Prescribed Fire Management Objectives*

Prescribed fire may be used to meet natural resource management objectives, assist in meeting wildland fire suppression objectives and as a tool to accomplish hazard fuel reduction projects.

### *Prescribed Fire Priority Areas*

#### **Prairie Maintenance**

Prescribed fire must be used to preserve, restore and maintain these unique and valuable habitats. The absence of fire will favor tree and shrub encroachment.

#### **Exotic Plant Areas**

Prescribed fire may also be used to reduce invasive exotic plant species such as smooth brome, (Bromus) Crested Wheatgrass, Leafy Spurge and Canada Thistle.

#### **Viewshed Maintenance**

At the time Fort Union was an active fur trading post, virtually all the timber near the fort would have been cut for lumber and firewood. Our intention is to keep the northern riverbank mostly free of timber and mature willows by using fire as a management tool.

### *Prescribed Fire Behavior*

The prescribed fire behavior must reflect resource management objectives of individual burn units. A variety of fire behaviors will be required to meet burn unit objectives and vary according to site conditions. Moderate fire behavior may be appropriate in areas with more ground fuels and smaller trees. Fire conditions must not be conducive for torching of trees. Most prescribed fires will occur in the spring months before native grasses sprout. Ignition will primarily be conducted with hand drip torches.

### *Prescribed Fire Planning*

A five year prescribed burn plan with maps has been developed and can found in Appendix F.

The park superintendent must approve prescribed burn plans prior to igniting burn units. Multiple burn units that include similar vegetation types, burn prescriptions, and resource management objectives are encouraged to be included within one prescribed burn plan.

Prescribed fire units may vary in size but larger units are encouraged to promote landscape scale restoration. Prescribed fire unit boundaries should utilize the ample natural features (river) and man-made features (existing roads) to define the perimeter. Construction of perimeter fire control lines should be discouraged due to increased ground disturbance and associated impacts to natural and cultural resources. Perimeter control lines are also costly to construct and increase risk to fire fighter safety during holding operations. However, interior control lines and mechanical fuels



treatment may be necessary to protect sensitive cultural and natural features from within the burn unit.

Planning and execution of this prescribed fire management program must follow qualified personnel guidelines stated in document RM-18. Refer to RM-18 for guiding all aspects related to implementing this prescribed fire program.

### *Fort Union Trading Post National Historic Site Prescribed Fire Units*

1. River Unit, Block 1  
Acres: 25  
Vegetation: Grass/forb community and riparian trees.  
Objectives: Maintain native vegetative community, reduce build up of dead fuel, and maintain historic scene.
2. River Unit, Block 2  
Acres: 97  
Vegetation: Native and exotic grasses and riparian trees and shrubs.  
Objectives: Maintain vigor of native grasses, stimulate diversity of vegetative community, reduce mature willow stands and replace with younger age class of willows, reduce the number of cottonwood trees. Stress exotic grass and weeds.
3. River Unit, Block 3  
Acres: 9  
Vegetation: Re-seeded native grasses, annual weeds and exotic weeds.  
Objectives: Maintain vigor of native grasses, stimulate diversity of vegetative community, and reduce annual weeds and exotic grasses and weeds.
4. Prairie Unit, Block 4  
Acres: 23  
Vegetation: Exotic grasses and native brush species  
Objectives: Reduce exotic grasses and shrub cover up to 80%, stimulate native species.
5. Prairie Unit, Block 5  
Acres: 30  
Vegetation: Re-seeded native grass species, annual weeds.  
Objectives: Maintain vigor of native grasses, stimulate diversity of vegetative community, and reduce annual weeds.
6. Prairie Unit, Block 6  
Acres: 75  
Vegetation: Re-seeded native grass species, annual weeds.  
Objectives: Maintain vigor of native grasses, stimulate diversity of vegetative community, and reduce annual weeds.

A mosaic burn pattern is expected with variable fire effects within each unit. Refer to attached map in Appendix F for burn locations.

## *Prescribed Fire Monitoring*

A fire effects monitoring program will be initiated with the prescribed fire program. Long term monitoring will include the installation of permanent plots to determine the effects of prescribed fire. Monitoring will determine if the quantifiable burn unit objectives have been achieved, such as the amount of tree and shrub mortality and the reduction of thatch. Long term monitoring will also detect if the resource management objectives are being achieved, such as percent change in grass cover. Monitoring should focus on smooth brome, crested wheatgrass and native grass responses to prescribed fires. Monitoring results will then be linked to adaptive management decisions.

All prescribed fire monitoring activities will follow guidelines in the NPS Fire Monitoring Handbook (FMH). FMH grass plots will likely be the most appropriate monitoring method for prairie burn sites.

Photo points are a very valuable monitoring tool and should be required for prescribed fire monitoring. The establishment of permanent photo points prior to a prescribed fire should be the absolute minimum monitoring procedure. The use of both FMH plots and photo points are effective monitoring methods.

All prescribed fires must include the appropriate number of prescribed fire monitors to record on site weather, smoke dispersal, fire behavior, and to collect data from FMH plots within the burn unit. A prescribed fire monitoring report will also be completed for each burn.

Refer to RM-18 for prescribed fire documentation and reporting requirements.

Critiques will also be accomplished after prescribed fire projects have been completed.

## *Air Quality*

The fire management program for Fort Union Trading Post National Historic Site will be in full compliance with interstate, state, and local air pollution control regulations as required by the Clean Air Act, 42 U.S.C. \_7418. All necessary state air quality clearances and permits will be obtained prior to the initiation of a prescribed fire program. A Simple Approach Smoke Estimation Model (or equivalent) analysis will be performed prior to all prescribed fires and will be utilized as need during wildland fires. During fire use activities smoke will be monitored for trajectory, mixing height, and impact to air quality sensitive areas.

Since 1980, the subject of air quality and its effect on the resources of Fort Union Trading Post National Historic Site, as well as the park visitor's enjoyment of those resources, has been of great concern to park managers. In carrying out day-to-day operations, park staff has followed a policy of carrying out its internal operations in such a way as to have a minimum impact on all site resources including air quality related values.

## **Fire Research**

Implementation of the FOUS FMP should not be contingent on the prior research of the local fire regime and fire effects on vegetation. However, there will be monitoring of fire effects using NPS Fire Monitoring protocol to measure resulting changes in vegetation, which will direct adaptive managing treatment throughout the fire management program.

As research opportunities present themselves, fire effects studies should be employed for ecologically sensitive areas, such as, riparian communities and soil movement either exacerbated by fire or subsequent stabilization of soils due to an increase in herbaceous cover.

## **Monitoring**

FOUS will develop short and long term monitoring programs to assess accomplishments and to determine effects of fire management activities on the cultural and natural resources. Monitoring is essential for adaptive management, where the qualitative and quantitative changes to resources will be measured and used as a tool to guide modifications for subsequent prescription treatments and burn objectives.

The NPS Fire Monitoring Handbook protocol will be implemented to fulfill monitoring plan requirements. Other valid monitoring strategies and protocols developed locally may be substituted for the standard monitoring protocols to meet specific management and information needs. Such monitoring programs will receive critical review prior to implementation.

## **Public Safety**

Uncontrolled fires can present a hazard to persons engaged in suppression activities and to the public visiting the site. The safety of all people in the area is the primary concern of the Incident Commander. In most cases, the small fires usually encountered within the site makes this a fairly simple concern. Usually the entire perimeter of the fire is easily monitored and there is little likelihood it will spread far. In these cases, the concern will be to keep the public out of the immediate fire area and far enough away that they will not hinder the suppression activities. Under no circumstance will anyone be permitted near a fire without the appropriate training and personal protective equipment required.

In the case of a larger wildland fire that has the potential to spread there may be the possibility that park visitors will be in areas of concern. Visitors will be informed at the visitor center regarding the fire and the area where caution should be exercised

Signs warning of possible smoke on the road will be placed on the park's roads if smoke produced during wildland and prescribed fires create a safety concern. Roads will be closed or ranger escorted convoys established if visibility on park roads is impaired.

Temporary closure of the site or a portion may be needed when large or erratic fire behavior endangers visitor and employee safety. When a fire threatens to escape from the park or has the potential to do so, adjacent authorities will be given as much advance notice as possible in order to take appropriate action.

## **Public Information and Education**

As with all park activities, the presence of an informed public can go far in providing support for the fire management program at Fort Union Trading Post National Historic Site and fostering its goals. A concerted effort will be made to make the public aware of fire concerns at the site including fire prevention messages, fire danger indices when they are high or extreme and the presence of on-going fires. Fire management messages will be introduced into interpretive programs where appropriate. The site will participate in fire prevention activities in the community. Park visitors will be made aware of regulations regarding the use of fire within the site. High fire danger notices will be posted in the visitor center when needed. The local media will be informed of fire prevention concerns through news releases. Media access to fire scenes will be facilitated when it is safe to do so. When interest is warranted, a staff member will be designated as the contact person for all information requests. Any media access to fires will be in compliance with the safety guidelines

## **PROTECTION OF SENSITIVE RESOURCES**

### *Archeological Sites*

All known archeological sites will be protected from fire, if a prescribed fire can be expected to negatively impact the resources. Every effort will be made to prevent a wildfire from impacting archeological resources. There exists the possibility that a wildfire or prescribed fire will reveal the location of an archeological site. A newly discovered archeological site will be documented and evaluated by an archeologist. Future use of fire at a new archeological site will be cleared by National Park Service Archeologists and the appropriate State Historic Preservation Officer.

### *Protection of Sensitive Natural Resources*

There are no known sensitive natural resources within the park. Should a sensitive natural resource become known protection measures will be developed and the plan amended to reflect those activities.

### *Modern Infrastructure and Developments*

Urban-interface mitigation techniques should be applied to prevent or at least reduce negative impacts to modern development and infrastructure within the site's boundaries.

## **Fire Critiques and Annual Plan Reviews**

### *Critiques*

All fires occurring within the site will receive at a minimum an review by those involved to evaluate such topics as: the response, "hotline" (on-going fire incident) review, control

methods used, safety concerns, and the need for new and replacement equipment. This review will be conducted by one of the following: the Incident Commander, the Fire Management Officer, or the official who is designated fire program responsibilities. The purpose of this review is to recognize and document actions that were successful and identify and rectify actions that needed to be corrected.

The superintendent will conduct closeout meetings with Incident Management Teams (IMT) to ensure a successful transition of the incident back to the site and to identify and evaluated incomplete fire business. Refer to RM-18, Chapter 13, Exhibit 1 for a sample closeout review with the IMT.

A regional or national level fire review may be conducted if one of the following occurs:

1. Crosses the site's boundaries into another jurisdiction without the approval of landowner or agency.
2. Resulted in adverse media attention.
3. Involved serious injury or death, significant property damage, or has the potential to do so.
4. Results in controversy involving another agency.

Refer to RM-18, Chapter 13, Exhibits 2 & 3.

All entrapments and fire shelter deployments will be reported and investigated as soon as possible after the deployment incident. Refer to RM-18, Chapter 13, Exhibit 4 & 5 for review directions and written outline format.

## *Plan Reviews*

An informal fire management program review will be conducted annually to evaluate current procedures and identify any needed changes to the site's FMP. A formal fire management review will be conducted every five years. The site Superintendent must approve significant changes to the body of this plan. The only exceptions to this procedure will include: grammatical corrections, minor procedural changes, deletions, corrections, and additions to the appendices. Copies of all changes will be promptly forwarded to the Fire Management Program Center. Changes requiring the approval and concurrence will be submitted with a new cover sheet for signature and dates, which will replace the original cover sheet upon receipt by the Superintendent.

## Appendices

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## ***B. Definitions***

- Appropriate Management Response – Specific actions taken in response to a wildland fire to implement protection and fire use objectives.
- Burning Index – A number related to the contribution that fire behavior makes to the amount or effort needed to contain a fire in a specified fuel type within a rating area.
- Confine – Confinement is the strategy employed in appropriate management responses where a fire perimeter is managed by a combination of direct and indirect actions and use of natural topographic features, fuel, and weather factors.
- Detection – The act or system of discovering and locating fires.
- Dispatcher – A person employed who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for appropriate management, and sends them to the proper place.
- Emergency – Any incident which requires the response of a fire protection organization's operations units and/or support units.
- Fire Management Plan – A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan.
- Fire Management Unit – Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that set it apart from management characteristics of an adjacent unit.
- Fire Management Area – A sub-geographic area within a Fire Management Unit that represents a predefined ultimate acceptable management area for a fire managed for resource benefits.
- Fire Occurrence – Number of fires per unit time in a specified area.
- Fire Prevention – All activities concerned with minimizing the incidence of wildfires.
- Fire Regime – Periodicity and pattern of naturally-occurring fires in a particular area or vegetative type, described in terms of frequency, biological severity, and aerial extent.
- Hazard Fuel Reduction – Any treatment of a fuel complex defined by kind, arrangement, volume, condition, and location that reduces a special threat of ignition or of suppression difficulty.
- Incident – An occurrence or event, either human-caused or natural phenomena, that requires action by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources.
- Incident Commander – Individual responsible for the management of all incident operations.
- Initial Attack – An aggressive suppression action consistent with firefighter and public safety and values to be protected.
- National Fire Danger Rating System (NFDRS) – A multiple index scheme designed to provide fire control and land management personnel with a systematic means of assessing various aspects of fire danger on a day-to-day basis.
- Natural Ignition – Any fire of natural origin (e.g., lightning, spontaneous combustion, volcanic activity).
- Preparedness – Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination.
- Prescribed Fire – Any fire ignited by management actions to meet specific objectives.
- Prescribed Fire Plan – A plan required for each fire application ignited by managers.
- Prescription – Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management response, and indicate other required actions.
- Resource Order – A form used by dispatchers, service personnel, and logistics coordinators to document the request, ordering or release of resources, and the tracking of those resources on an incident.
- Weather Information Management System (WIMS) – A comprehensive system that helps to manage weather information used in wildland fire program management.
- Wildfire – An unwanted wildland fire.
- Wildland Fire – Any non-structure fire, other than prescribed fire, that occurs in the wildland.

- Wildland Fire Management Program – The full range of activities and functions necessary for planning, preparedness, emergency suppression operations, and emergency rehabilitation of wildland fires, and prescribed fire operations, including non-active fuels management to reduce risks to public safety and to restore and sustain ecosystem health.
- Wildland Fire Situation Analysis (WFSa) – A decision making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.
- Wildland Fire Suppression – An appropriate management response to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire.
- Wildland Fire Use – The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.



### *C. NEPA and NHPA Compliance*

#### *D. Wildland and Prescribed Fire Monitoring Plan*

To be completed by NGPA Fire Effects group in coordination with FMO for unit.

### *E. Multi-Year Prescribed Fire and Fuels Reduction Schedule*

This is a suggested sequence based on spatial distribution. Multiple burn units can be conducted in a single season if desired. Firing will be conducted with a hand torch. Ignition will occur in spring. Acreage of burn units includes perimeter and the actual burned or “black” acres within each unit will be much less due to sparse fuels and natural fuel breaks.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
River Unit Block 1 Acres: 25		X						X		
River Unit Block 2 Acres: 97	X			X				X		
River Unit Block 3 Acres: 9		X		X			X			
Prairie Unit Block 4 Acres: 23	X			X			X			X
Prairie Unit Block 5 Acres: 30	X		X				X			X
Prairie Unit Block 6 Acres: 75	X		X		X		X			X

“X” indicates the year the unit is to be treated with prescribed fire.

### *F. Training Analysis and Needs*

	Positions Required		
Employee/Position	ICT4 – 1	FFT1 – 1 may also be the ICT4	FFT2 - 2

T = trainee  
Q = qualified

*G. Maps*

## *H. Prescribed Fire Plan Outline*

- Description of the Prescribed Fire Area including map, using the Maximum Manageable Area concept.
- Goals and Objectives: Identification of the purpose of the burn, resource management goals stated in the land management plan, and specific objectives of the fire, stated in measurable terms.
- Range of acceptable results expected, expressed in quantifiable terms.
- Project Assessment
  - Complexity: Identification of the level of complexity of the prescribed fire.
  - Risk Assessment. A risk assessment that portrays an indication of the probabilities of success and consequences of failure for this prescribed fire. As a minimum, consider all risk and complexity elements described in the NWCG Complexity Guidebook as well as planned mitigation measures.
- Prescribed Fire Implementation Actions.
  - Pre-burn Considerations, on- and off-site: Define line to be built, snags to be felled or protected, equipment to be pre-positioned, special features to be protected, warning signs to be placed, weather recording and monitoring needs, etc. Include responsibility and timeframes.
  - Briefing: Identify and analyze the safety hazards unique to the individual prescribed fire project and specify personnel safety and emergency procedures. Include requirements for use of personal protective equipment. If aerial ignition devices will be used, include an Aerial Ignition Operation Hazard Analysis and Aviation Operating Plan including firing map and primary/secondary aircraft landing sites.
  - Test Fire: Provisions for a test fire and recording the results. The test fire must be ignited in a representative location within the prescribed fire area to test key fire behavior characteristics prescribed to meet management objectives. In many applications, analysis of the initial ignitions may provide adequate test fire results. On multiple-day projects, evaluation of current fire behavior may provide a comparative basis for continuing. When in doubt, initiate a separate test fire and evaluate results.
  - Prescribed Fire Prescription: A prescribed fire prescription containing those key parameters needed to achieve desired results. Prior to ignition, compare prescription elements, both individually and collectively, against local weather forecasts and any other predicted conditions. Any changes to prescriptive parameters must be approved by the same level of authority required for plan approval.
  - Special Conditions, Public and Personnel Safety: Describe public and personnel safety and emergency procedures. Specify that all personnel who are within the active burn area will have personal protective equipment. Identify safety hazards on the burn, measures taken to reduce those hazards, and EMS personnel on the burn. Specify emergency medical procedures, evacuation routes, and emergency facilities to be used.

- **Burn Organization:** List required management personnel, and positions they will fill. Specify the number of crew personnel that are needed. No less than the organization described in the approved plan shall be used to execute the burn.
- **Ignition Plan:** Describe necessary ignition operation including firing techniques and patterns. Maps showing firing patterns may be included. Necessary resources, personnel qualifications, equipment, and supplies must be listed.
- **Holding Plan:** Provision for holding actions to maintain the prescribed fire within prescription. Firing, holding, patrol and mop up procedures are required. If actions needed to keep the fire within project boundaries exceeds predetermined definition of holding actions, suppression action will be taken. However, when the necessary holding action exceeds the capability of the on-site contingency resources or poses significant threats to life, property, or high value resources, a new strategy is determined through a Wildland Fire Situation Analysis.
- **Cooperation:** Provisions for interagency and intra-agency pre-burn coordination and, where applicable, public involvement and burn day notification to appropriate individuals, agencies and the public.
- **Contingency Plan:** Identification of contingency actions to be taken if the fire exceeds prescription parameters and/or line holding capabilities and cannot be returned to prescription. Use the Wildland Fire Situation Analysis (WFSA) process to determine appropriate strategy.
- **Funding:** The source of funding and estimated costs.
- **Smoke Management and Air Quality:** Smoke management requirements. Describe how the project will comply with County, State, Tribal, and Federal air quality regulations. Include modeling outputs and mitigation measures to reduce the impacts of smoke production, if taken.
- **Monitoring:** Provisions for post-burn evaluation to enable resource managers and the Agency Administrator to determine if project objectives have been met. Document burn day conditions, fire behavior, smoke dispersal, first order fire effects, and cost per acre of treatment. Specify the weather information (forecast and observed) required during all phases of the project, the procedures for acquiring it, including when and by whom, and if spot weather and smoke dispersal forecasts need to be requested. In addition to short-term monitoring to document the results of a burn, long-term monitoring is strongly recommended. Permanent photo points, transects, or plots which are revisited in years following a burn will provide information on successional trends which result from the burn. Longer term monitoring may be necessary to determine if objectives were met.
- **Post-burn Activities:** Provisions for post-burn evaluations.

## *I. Agreements*

Agreements with neighboring fire management agencies will be completed following the completion of the Environmental Assessment and Fire Management Plan.



## *J. Interagency Contacts*

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